$$M(K^+ \to \pi^+\pi^+\pi^-) \approx c\sqrt{2}\,\frac{E_-}{m}\,M(K_1^0 \to \pi^+\pi^-), \tag{8}$$

where E is the total energy of the π^- meson.

Relation (8), which was first derived in [3], makes it possible to relate the probabilities of the K → 3π and K → 2π decays, and also to calculate the spectrum of the π mesons in K → 3π decay in good agreement with the experiment [7]. The agreement between relation (8) and the result of [3] is connected with the fact that on going from the physical region of the K → 3π decay to the physical region of the K → 2π decay the pole denominator in the diagrams of Fig. 2 remains constant with accuracy to terms $\sim\mu^2/m^2$.

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DISCHARGE-CONDENSATION METHOD OF DETECTING CHARGED-PARTICLE TRACKS

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The new discharge-condensation method proposed below for the detection of charged-particle tracks combines the high time resolution of spark chambers and the long time of memorization of a selected event which is characteristic of condensation chambers.

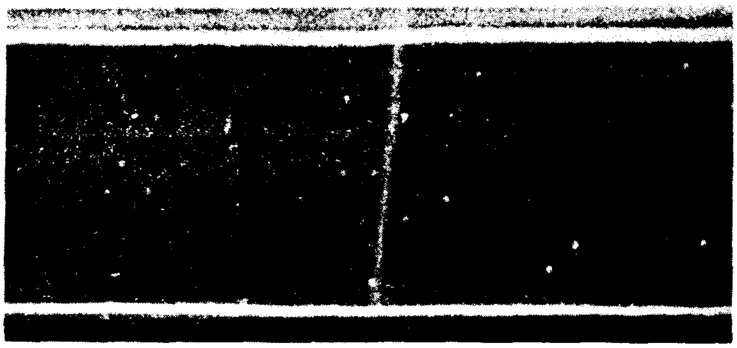
The principle of the discharge-condensation method is as follows: the ionization electrons produced by a charged particle in a mixture of the working gas and the condensate initiates a gas discharge in a pulsed electric field. The amplitude and duration of the electric pulse are chosen such as to prevent the discharge from becoming visible. The ions produced by the gas discharge act as condensation centers when the working volume is adiabatically expanded. The degree of expansion is chosen to be much lower than the threshold value necessary for ordinary operation of condensation chambers, but sufficient for condensation on large ion clusters, such as are characteristic of Townsend cascades.

Thus, the high time resolution of the events, amounting to several microseconds, is due, as in spark chambers, to the fact that the discharge is initiated by electrons, whereas the information concerning the selected event is stored in the form of a column of ions, thus ensuring a long memory time - several dozen milliseconds, as in condensation chambers.

The combination of the two properties in one instrument is unique, and one can expect this method to be used for the solution of a number of physical problems.

To obtain particle tracks by the discharge-condensation method, we used a cylindrical chamber of 30 cm diameter and 5 cm height, with a conventional expansion mechanism. A high-voltage pulse from an Arkad'ev-Marx generator was applied between the upper cover and a perforated grid installed in front of a rubber diaphragm. The pulse duration was regulated with an air discharge gap shunting the chamber. The chamber was filled with pure neon to a pressure of 1.1 atm, and ethyl alcohol was used as the condensate.

The discharge-condensation chamber was triggered by a scintillation-counter telescope. The delay time between the instant of particle passage through the chamber and the application of the high-voltage pulse to the electrodes did not exceed 1 μsec.



Photograph of cosmic-ray particle track in a discharge-condensation chamber (scale 1:1).

The figure shows one of the first photographs of a cosmic-ray particle track in a discharge-condensation chamber. The tracks were photographed perpendicular to the direction of the electric field with the illumination delayed 40 msec relative to the triggering pulse, at a relative lens aperture 1:22 and a light-flash power of approximately 80 J. The degree of chamber expansion was 1.04. It should be noted that these conditions are not nominal and can be subsequently improved.

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On page 51, line 13 from the bottom, printed [5,6] should read [4,5];
" " 51, " 12 " " " , " [7] " " [6];
" " 52, " 11 " " " , " [9] " " [8];
" " 52, " 7 " " " , " [10] " " [9];
" " 53, " 5 " " top , " [11] " " [10].